8. Mark

Program Name: Mark.java   Input File: mark.dat

In the 2015 movie The Martian, the astronaut Mark Whatney is lost in a sand storm on Mars and presumed to be dead. His fellow astronauts are forced to leave him behind and leave Mars and return to Earth. Turns out Mark was not dead and survived the sand storm only to find himself alone on Mars with no means of communicating with Earth. Among the many epic and heroic tasks he completes to eventually find his way back home, he determines the location of the Mars probe Pathfinder. Once the batteries are recharged, he uses Pathfinder to re-establish contact with NASA. He can only use Pathfinder's camera to communicate. There is no voice or text communication. Mark decides to use hexadecimal digits to send photographic messages back to NASA by positioning drawings of each hex digit evenly spaced on a circle around the camera in a counter clockwise fashion. To send messages to Mark, NASA points the camera at the appropriate hex digits to indicate the ASCII value of each letter in the message.

Now, let's imagine that you could somehow send Mark a program that would allow the Pathfinder probe to interpret the movement of its camera and determine each letter for him. Pathfinder records how many degrees the camera turns each time NASA points it at a particular hex digit, and that information is stored in a file. The camera moves both clockwise and counter clockwise. The digit 0 corresponds with 0 degrees and Mark points the camera at 0 each time he is to receive a collection of messages from NASA. Counter clockwise movement is indicated with positive values and clockwise movement is indicated with negative values. Each message will be no longer than one sentence. A period, exclamation mark or question mark will indicate the end of each sentence.

Input: A list of values representing each turn of the Pathfinder's camera measured in degrees. The values will be shown 10 per line.

Output: Each of the messages on a separate line.

Sample input:

```
90 90 -45 -22.5 22.5 135 -135 135 -135 202.5
67.5 -45 90 202.5 -157.5 -112.5 135 -112.5 90 112.5
157.5 -22.5 67.5 -67.5 135 -112.5 90 -22.5 -67.5 -45
157.5 45 -67.5 202.5 180 -45 -67.5 -45 90 -112.5
112.5 157.5 -180 -90
```

Sample output:

```
Hello Mark!
Are you OK?
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